Agilent
GPIB, USB and Instrument Control for easy PC-to-Instrument Connections

Data Sheet

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Agilent Technologies

Introducing Agilent GPIB, USB and Instrument Control Products

Agilent instrument control hardware enable:

- Easy connection to GPIB instruments based on simple plug-and-play setup and configuration
- Use of PC-standard interfaces that are prevalent even on notebook PCs, such as USB and LAN
- A wide selection of interfaces to fit your test system application – PCI, PCIe®, USB and LAN
- Use of industry-standard I/O libraries which makes integration of existing instruments and software programs in a single system easy, even if you use multiple instrument vendors.

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Connecting is as Easy as 1-2-3

1. **Install** Agilent IO Libraries Suite software on your PC
2. **Hook up** the instrument control hardware (USB, LAN, RS-232 or GPIB cables) between your instruments and your PC
3. **Detect instruments** and devices, then configure interfaces with Connection Expert

Establish a connection in less than 15 minutes

Agilent IO Libraries Suite eliminates the many working hours it takes to connect and configure PC-controlled test systems, especially if it involves instruments from multiple vendors. In fact, with IO Libraries, connecting your instruments to a PC is as easy as connecting a PC to a printer.

Easily mix instruments from different vendors

Agilent IO Libraries Suite eliminates headaches associated with trying to combine hardware and software from different vendors. The software is compatible with GPIB, USB, LAN and RS-232 test instruments that adhere to the supported interface standards, no matter who makes them.

When you install the IO Libraries Suite, the software checks for the presence of other I/O software on your computer. If it finds another vendor's VISA libraries, it automatically installs in a side-by-side mode that allows you to use the existing I/O software and the Agilent software together in multi-vendor systems.

Work in the environment that's comfortable to you

In addition, the IO Libraries are compatible with a variety of application development environments and programming APIs including Agilent or NI VISA, VISA COM, SICL, Agilent 488 (compatible with NI-488.2), and Agilent VEE. There is flexibility to choose the software and hardware of your choice to get your job done.

Works with millions of existing instruments from hundreds of vendors

Agilent instrument control hardware and IO Libraries are trusted and known for their reliability. The IO Libraries ships with more than 150 instruments from Agilent Technologies. If you already own an Agilent instrument control hardware or instrument, you can download the latest version of Agilent IO Libraries Suite for free.

Agilent IO Libraries Suite 16.3

System requirements

PC software

Operating system	• Windows 8 32-bit and 64-bit (Windows 8, Windows 8 Pro, and Windows 8 Enterprise) • Windows® 7 SP1 32-bit and 64-bit (Starter, Home Basic, Home Premium, Professional, Ultimate, Enterprise) • Windows Vista® SP1 and SP2 32-bit and 64-bit (Home, Home Premium, Business, Ultimate, Enterprise Editions) • Windows XP Pro or Home edition service pack 3 or later, 32-bit only • Windows Server 2012 64-bit (Standard) • Windows Server 2008 R2 SP1, 64-bit (Standard and Enterprise)

PC hardware

Processor	600 MHz class *(800 MHz or greater recommended)*
RAM	• Windows XP: 256 MB minimum *(1 GB or greater recommended)* • Windows Vista or Windows 7: 1 GB minimum
Hard disk space required	1.5 GB
Display	1024 x 768, 96 or 120 DPI

Supported development environments and supported I/O software

VB6	VISA COM, VISA, SICL, Agilent 488, Excel VBA
C/C++, Managed C++	VISA COM, VISA, Agilent 488
.NET languages (VB.NET, C#)	VISA COM, VISA, Agilent 488
LabVIEW	VISA, Agilent 488
MATLAB	VISA

Note: Agilent IO Libraries Suite supports VEE Pro program development with drivers and/or Direct IO.

I/O utilities

Connection Expert	Automatically scans and configures your instrument IO, helps you get connected quickly and easily and displays the status of your interfaces and instruments
Interactive IO	Lets you quickly send commands to instruments and read responses
Interactive LXI	Allows you to send and receive LXI events, monitor, and manage LXI instrument precision clocks
IO Monitor	Lets you monitor and debug I/O calls made on any of Agilent's supported buses using Agilent SICL, VISA, VISA COM, or Agilent IVI instrument drivers (released after September 18, 2010)
IO control	Provides easy access to the IO Libraries Suite from the Windows system tray
viFind32	Debug utility uses VISA functions to find resources and lists them in a console window
VXI resource manager	Provides configuration of the IEEE 1394 connection from PC to VXI

See the following URL for more information or for the latest updates: **www.agilent.com/find/iosuite**

Agilent 82357B USB/GPIB Interface Converter

Features

- Fast and easy connection to GPIB instruments
- Uses standard USB and IEEE-488 interfaces
- Maximum GPIB transfer rate of 1.15 MB/s
- Parallel polling capability

Best for

- Easiest GPIB connectivity
- Notebook computer GPIB connection

Connect GPIB instruments quickly and easily to your computer's USB port

The Agilent 82357B USB/GPIB interface provides a direct connection from the USB port on your desktop and laptop computers to GPIB instruments. Once the software is loaded, your computer automatically detects the 82357B when it is connected to the USB port of the computer.

The 82357B is a plug-and-play device. It is also hot-pluggable, making it easy to connect and disconnect without having to shut down the computer. No external power supplies are necessary.

The 82357B USB/GPIB interface implements USB 1.1 (12 Mbits/s) and is compatible with USB 2.0. The 82357B USB/GPIB interface uses a thin, flexible, high-quality USB cable that is USB 2.0-compliant. The USB cable is shielded, and the connector is specified to 1,500 insertions, ensuring a durable connection and reliable data transfer.

Boosting performance with simplest connectivity

82357B technical specifications

General requirements	
Minimum system requirements	Refer to page 4 for requirements in using the Agilent IO Libraries software (included with the instrument control hardware)
Supported standards	• Supports USB 2.0 high speed • Standard USB endpoints supported • IEEE-488.1 and IEEE-488.2 compatible • SICL and VISA 2.2
Unsupported GPIB modes of operation	• Pass Control • Non-System Controller mode
General characteristics	
Power	USB bus-powered device, +5 V, 500 mA (maximum), 200 mA (typical)
Maximum data rate (GPIB)	1.15 MB/s
Connectors	• Standard 24-pin IEEE-488 (GPIB) • Standard USB A
USB hubs	Self-powered hubs
Parallel polling	A single parallel poll can easily check up to eight individual devices at once, corresponding to the number of data lines on the GPIB
Cable	2.5 meters, shielded, connector rated for 1,500 insertions
LED indicators	READY, ACCESS, FAIL
Maximum instrument connection	14 instruments—daisy chain via GPIB. A maximum of 4 converters can be connected to the PC.
Configuration	Plug-and-play
Warranty	1 year
EMC and safety	• IEC 61010-1: 2001/EN 61010-1: 2001 • USA: UL61010-1: 2004 • Canada: CSA C22.2 No. 61010-1: 2004
Dimensions	
Length, width, and height	105 mm (L) x 64 mm (W) x 30 mm (H) (including connectors)
Weight	215 grams
Environmental specifications	
Operating environment	0 °C to 55 °C
Operating humidity	Up to 90% at 40 °C non-condensing
Storage environment	–40 °C to 70 °C
Storage humidity	Up to 90% at 65 °C non-condensing
Ordering information	
Includes	Agilent IO Libraries Suite and VISA/SICL programming manuals on CD-ROM
Accessories	GPIB cables/adapter (see page 11)

Agilent 82350B High-Performance PCI GPIB Interface Card

Features

- PCI IEEE-488 interface for PCs
- Transfer rates up to 900 KB/s
- Dual processor support on the latest Windows operating system

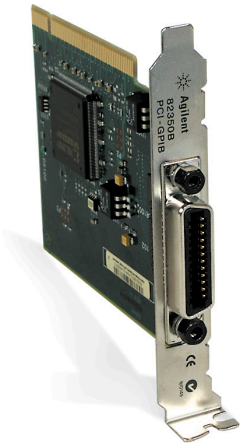
Best for

- Maximum GPIB throughput for all configurations

High performance for manufacturing test applications

The 82350B is Agilent's highest-performance GPIB interface. With a direct PCI computer connection, transaction overhead is minimized for the best overall performance.

The 82350B card de-couples GPIB transfers from PCI bus transfers. Buffering provides connectivity and system performance that is superior to direct memory access (DMA). The hardware is software-configurable and compatible with the plug-and-play standard for easy hardware installation. The GPIB interface card plugs into a 5 volt PCI slot in the backplane of your PC.



This traditional GPIB connection still offers the highest throughput

82350B technical specifications

General requirements	
Minimum system requirements	Refer to page 4 for requirements in using the Agilent IO Libraries software (included with the instrument control hardware)
PCI bus slot	5-V PCI slot, 32 bits
Supported standards	IEEE 488.1 and IEEE 488.2 compatible, PCI rev 2.1
General characteristics	
Power	Backplane +5 V PCI
Connectors	• Standard 24-pin IEEE-488 (GPIB) • +5 V PCI
Maximum data rate	900 KB/s
Maximum instrument connection	14 instruments—daisy chain via GPIB
Buffering	Built-in
Configuration	Plug-and-play
EMC and safety	IEC 61326-1: Group 1, Class A IEC 61010-1
Warranty	1 year
Dimensions	
Length, width, and height	122 mm (L) x 122 mm (W) x 22 mm (H) (a full-height PCI card)
Weight	0.091 kg
Environmental specifications	
Operating environment	0 °C to 55 °C
Operating humidity	Up to 90% at 40 °C non-condensing
Storage environment	–40 °C to 70 °C
Storage humidity	Up to 90% at 65 °C non-condensing
Ordering information	
Includes	Agilent IO Libraries Suite and VISA/SICL programming manuals on CD-ROM
Accessories	GPIB cables/adapter (see page 11)

Agilent 82351A High-Performance PCI Express® (PCIe) GPIB Interface Card

Features

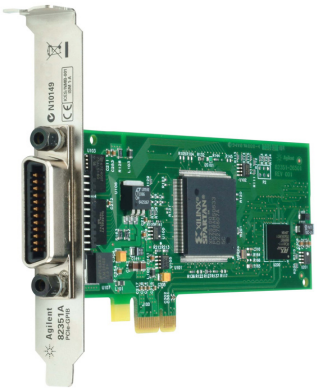
- Compact half-height size (68.9 mm)
- High transfer rate of 1.4 MB/s
- High flexibility via up-plugging (to x4 or x8 PCIe slots)
- 3.3 V signal level for lower power consumption

Best for

- Bandwidth-intensive PC applications
- Adding GPIB connection for PCIe based PCs or workstations

High transfer rate for demanding test applications

The Agilent 82351A PCIe-GPIB interface card is designed for integration into next generation PCs or workstations. It offers fast data transmission for various demanding test applications that require data to be transferred to memory fast enough without any loss or overwriting. PCIe (PCI Express) is an evolutionary version of PCI that offers a higher transfer rate across a low number of wires. It is also backward-compatible with PCI software, so you don't need to perform any code re-configuration. The powerful bus architecture of PCIe allows bidirectional data transmission, and the implementation of a new class of test applications.



New standard for high-speed internal devices

82351A technical specifications

General requirements	
Minimum system requirements	Refer to page 4 for requirements in using the Agilent IO Libraries software (included with the instrument control hardware)
PCI bus slot	3.3 V PCIe slot, 32 bits
Supported standards	• PCIe rev. 1.0a • IEEE 488.1 and IEEE 488.2 compatible
General characteristics	
Power	Backplane +3.3 V PCIe
Connectors	• Standard 24-pin IEEE-488 (GPIB) • +1.5 V PCIe
Maximum data rate	1.4 MB/s
Maximum instrument connection	14 instruments—daisy chain via GPIB
Buffering	Built-in
Configuration	Plug-and-play
EMC and safety	• IEC 61010-1: 2001/EN61010-1: 2001 • IEC 61326: 2002/EN61326: 1997+A1: 1998+A2: 2001+A3: 2003 • Pollution Degree 2 • Indoor use only
Warranty	1 year
Dimensions	
Width, depth, and height	120.8 mm (W) x 158.0 mm (D) x 21.6 mm (H)
Weight	0.082 kg
Environmental specifications	
Operating environment	–5 °C to 60 °C
Operating humidity	Up to 90% at 40 °C non-condensing
Storage environment	–40 °C to 70 °C
Storage humidity	Up to 90% at 65 °C non-condensing
Ordering information	
Includes	Agilent IO Libraries Suite and VISA/SICL programming manuals on CD-ROM
Accessories	GPIB cables/adapter (see page 11)

Agilent E5810B LAN/GPIB/USB Gateway NEW

Features

- Remote access and control of GPIB, USB and RS-232 instruments
- Faster GPIB transfer rate of up to 1.2 MB/s
- Supports 1000BASE-T (1 Gigabit)/100BASE-TX/10BASE-T LAN/Ethernet connection
- Power switch for hard reset
- Password-protected web interface for configuration
- LCD display for easy setup and use

Best for

- Connection to GPIB, USB and RS-232 instrumentation
- Shared test systems

One-box connectivity solution—now with USB capability

The E5810B is the next generation of the E5810A and expands the gateway's capability to include USB connectivity. The E5810B connects up to 14 GPIB instruments, up to four USB instruments via a self-powered hub and an RS-232 instrument, giving test engineers a fast and efficient one-box solution to control various instrument interfaces over LAN, even remotely via wireless connection.

The E5810B's versatility makes it ideal for system integrators, manufacturing testing, automated testing and other applications requiring an unlimited connection range and simultaneous connectivity to multiple instruments, both locally and remotely.

The E5810B is the next generation of the E5810A and provides a gateway between networked-equipped computer systems (using LAN) and GPIB/USB/RS-232 instruments.

High transfer rates enhance performance

With an improved GPIB transfer rate of 1.2 MB/s, test engineers can reduce test time and improve production throughput. The E5810B also features 1000BASE-T (1 Gigabit) LAN/Ethernet compatibility in addition to existing 100BASE-TX and 10BASE-T supportability to meet the demands of higher network bandwidth. This will also allow optimal data transfer rates when a USB 2.0 instruments is connected to the IO interface

Configure your instrument via the LCD display

With the E5810B's built-in LCD display, users can quickly retrieve the IP address of the gateway and other system messages without needing to install additional software.

The E5810B also comes with LED indicators on the front panel display, allowing users to determine the connection statuses of the gateway box at a glance. The green indicators cover LAN connection, GPIB, USB or RS-232 instrument activity and whether the gateway is powered on, while a lit red FAULT indicator points to possible hardware failure.

Perform wireless communication

The E5810B enables wireless communication to instruments where LAN connection is unavailable or inconvenient by connecting a wireless router to the E5810B.

Safeguard information with security functions

The E5810B comes with protection features to safeguard sensitive information, requiring a secure password to access and modify all web configuration pages, while the secure erase feature is a standard product feature in all Agilent equipment that will erase the system's preset and data information. Press the preset button on the E5810B's front panel to erase data information securely,

E5810B technical specifications

General requirements	
Minimum system requirements	Refer to page 4 for requirements in using the Agilent IO Libraries software (included with the instrument control hardware)
Supported standards	GPIB Standard IEEE 488.1 and IEEE 488.2 USB 2.0 or lower (with the USBTMC-USB488 protocol) LAN/Ethernet: 10BASE-T/100BASE-TX/1000BASE-T networks RS-232 VXI-11 Protocol VISA 2.2 and Agilent SICL
General characteristics	
Power consumption	+12 VDC, 2 A Isolated ELV supply source
Connectors	Standard 24-pin IEEE-488 (GPIB), USB 2.0, RS-232 (9-pin), LAN RJ-45
Maximum data rates	1.2 MB/s for GPIB 115 Kb/s for RS-232 480 Mb/s for USB
Maximum instrument connection	14 GPIB instruments 1 USB connection (supports up to 4 USB instruments via self-powered hub) 1 RS-232 instrument Up to 16 simultaneous connectivity connections
LED indicators	Power, LAN, GPIB, USB, RS-232, FAULT
EMC and safety	IEC61326-1:2005 / EN61326-1:2006 Canada: ICES/NMB-001: Issue 4, June 2006 Australia / New Zealand: AS/NZS CISPR11:2004 IEC 61010-1:2010 / EN 61010-1:2010 (3rd Edition)
Warranty	3 years
Network protocols	See the E5810B User's Manual for supported network protocols and functions
Dimensions	
Width, depth and height	226.5 mm (8.92 in) × 238 mm (9.37 in) × 61mm (2.36 in)
Weight	1.3 kg
Environmental specifications	
Operating environment	Operating temperature from 0 °C to 55 °C Relative humidity up to 95% RH at 40 °C Altitude up to 2000 m Pollution Degree 2 Installation Category II (through an AC/DC adapter)
Storage environment	Storage temperature from –40 °C to 70 °C Relative humidity up to 90% RH at 65 °C
Ordering information	
Standard shipped accessories	Power cord and adapter Printed Quick Start Guide Agilent Automation-Ready CD with Agilent IO Libraries Suite
Options	Option 100 – Rack Mount Kit GPIB cables/adapter (see page 11)

Agilent E5810A LAN/GPIB Gateway

Features

- Remote access and control of GPIB instruments via LAN
- Easy setup and use via digital display and web browser

Best for

- Connection to remote GPIB and RS-232 instrumentation
- Shared test systems

Remote access and collaboration with GPIB instruments via your LAN

The E5810A can use DHCP, if available, to automatically configure necessary network parameters, including its IP address. The gateway can be controlled from multiple locations and by multiple users via your LAN, so it is easy to share control of instruments from locations worldwide.

For easy remote access, enter the IP address from the digital display as the URL in your web browser and gain access to connected GPIB and RS-232 instruments. Then use your browser to send instrument commands interactively, and quickly see your measurement results. Use the digital display and LEDs to check the IP address and troubleshoot locally.

System use

For system environments, the E5810A gateway can be mounted on a rack. The rack mount kit (Option 100) allows two devices to be placed side-by-side in one rack width. With its built-in power supply, there are no additional power modules to mount.

For faster speed, USB connectivity and enhanced performance, take a look at the E5810B LAN/GPIB/USB gateway (see page 8).

Take advantage of LAN technology for your GPIB instruments and test systems

E5810A technical specifications

General requirements	
Minimum system requirements	Refer to page 4 for requirements in using the Agilent IO Libraries software (included with the instrument control hardware)
Supported standards	• IEEE 488.1 and IEEE 488.2 compatible • 10BASE-T/100BASE-TX networks • VXI-11 protocol • RS-232 • VISA 2.2 and Agilent SICL
General characteristics	
Input voltage	Universal input 100 to 240 V (± 10%) @ 47 to 63 Hz
Power	25 VA peak (7.5 Watts typical)
Power line frequency	47 to 63 Hz
Connectors	Standard 24-pin IEEE-488 (GPIB), RS-232 (9-pin), LAN RJ-45
Maximum data rates	900 KB/s—GPIB port 115 Kb/s—RS-232 port
Maximum instrument connection	14 instruments—daisy chain via GPIB 1 RS-232 device Up to 16 simultaneous connectivity connections
Indicators	LEDs for Power, Activity, Fault
EMC and safety	• IEC 61326-1: Group 1, Class A • IEC 61010-1 • Pollution Degree 2 • Indoor use only
Warranty	3 years
Network protocols	See the E5810A User's Manual for supported network protocols and functions
Dimensions	
Width, depth and height	212.3 W x 230 D x 43.4 H (mm) (1U height, ½ rack)
Weight	1.6 kg
Environmental specifications	
Operating environment	–5 °C to 60 °C
Operating humidity	Up to 95% at 40 °C non-condensing
Storage environment	–40 °C to 70 °C
Storage humidity	Up to 90% at 65 °C non-condensing
Ordering information	
Includes	Agilent IO Libraries Suite and VISA/SICL programming manuals on CD-ROM
Accessories	• GPIB cables/adapter (see page 11) • Rack Mount Kit (Option 100)

Agilent GPIB, USB and Instrument Control Products Summary

Cables

Agilent also offers a variety of cables that provide easy and reliable connections. Agilent cables are engineered for exceptional reliability and durability, even under the harshest conditions.

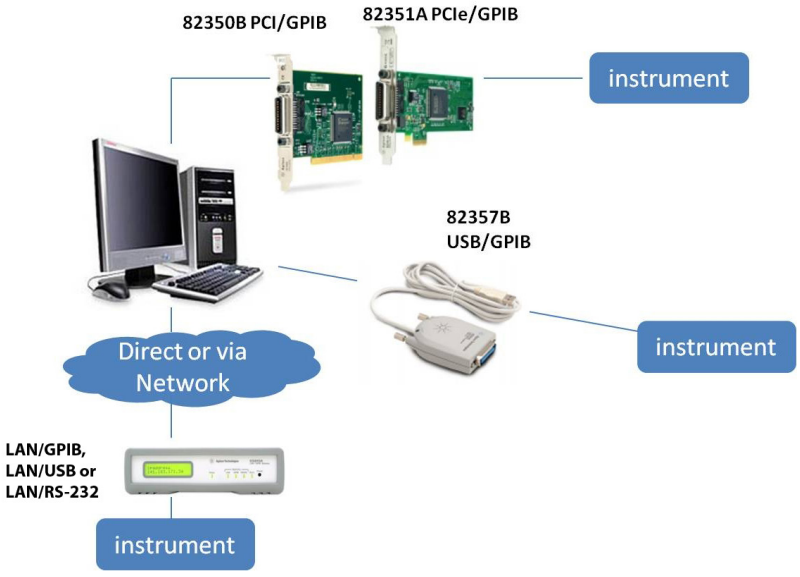
Cable	Length
10833D GPIB cable	0.5 meter
10833A GPIB cable	1 meter
10833B GPIB cable	2 m
10833C GPIB cable	4 m
10833F GPIB cable	6 m
10833G GPIB cable	8 m

Adapters

The 10834A GPIB-to-GPIB adapter can help when limited rear-panel space and other design considerations make cabling difficult. The 10834A adapter extends the first cable by 2.3 cm away from the rear panel to provide clearance for other connectors, switches, and cables.

Type	Product	Best for
GPIB board	82350B PCI/GPIB card	• GPIB connection for PCI-based PCs or workstations • Maximum throughput for all configurations up to 900 KB/s
	82351A PCIe/GPIB card	• GPIB connection for PCIe-based PCs or workstations • High throughput applications up to 1.4 MB/s
USB converter	82357B USB/GPIB card	• GPIB connectivity, even for notebook computers • Easiest GPIB instrument set-up to PC
LAN converter	E5810A LAN/GPIB gateway	• Connection to remote GPIB and RS-232 instruments • Test-system sharing and collaboration among multiple users
	E5810B LAN/GPIB/USB gateway	• One-box connectivity - remote GPIB, RS-232 and USB connections • Test-system sharing and collaboration among multiple users
Cable	10833x GPIB cables	• Connection between GPIB instruments (daisy-chain) • Connection from GPIB instrument to the PCI/GPIB or PCIe/GPIB card • Connection from GPIB instrument to the LAN/GPIB/USB gateway
Adapter	10834A GPIB-to-GPIB adapter	• 2.3-cm clearance at GPIB instrument's rear panel

Typical configurations of PC-to-instrument connection



Related Agilent Literature

Publication title	Pub number
Simplified PC Connections for GPIB Instruments, Application note 1409-1	5988-5897EN
This article covers the common PC-to-GPIB instrument configurations. It explains the I/O hardware and software considerations for easy GPIB instrument hook-up and automation. Where to download: **www.agilent.com**	
Modern Connectivity–Using USB and LAN Connectivity Converters, Application note 1475-1	5989-0123EN
As more and more instruments are equipped with PC-standard interfaces such as USB and LAN, various instrument control converters are available in the market today, besides the traditional PCI/GPIB cards. What are the advantages of one over the other? What are the key factors that you need to consider before you decide on buying the instrument control product that's most suitable for your application? This article explains all of the above, with a detailed comparison of data rates over various interfaces. Where to download: **www.agilent.com**	
Computer Connectivity Considerations, Application note 1465-2	5988-9818EN
This article complements the above (5989-0123EN) with additional focus on instrument-to-PC configuration, and cost comparison. Where to download: **www.agilent.com**	
Tips and Tricks for Using USB, LAN and GPIB	5989-3312EN
This article provides a variety of tips and tricks that will help you create flexible test systems that can easily incorporate USB, LAN, GPIB and RS-232C. Where to download: **www.agilent.com**	
Tips on using Agilent GPIB Solutions in National Instrument's LabVIEW Environment	5990-3731EN
This article provides answers to frequently asked questions about incorporating Agilent GPIB instrument control hardware into a National Instrument's LabVIEW system. Easy-to-follow steps are also documented in a video. Where to download: **www.agilent.com/find/gpibtips**	
System Developer Guide: Using LAN in Test Systems: The Basics, Application note 1465-9	5989-1412EN
This article is the first of a series of four application notes with System Developers in mind. It explains with great depth how you can simplify test integration by taking advantage of open connectivity standards. Meet your throughput requirements yet stay within budget. Where to download: **www.agilent.com**	
System Developer Guide: Using LAN in Test Systems: Network Configuration, Application note 1465-10	5989-1413EN
This article is the second of a series of four application notes with System Developers in mind. It explains with great depth how you can simplify test integration by taking advantage of open connectivity standards. Meet your throughput requirements yet stay within budget. Where to download: **www.agilent.com**	
System Developer Guide: Using LAN in Test Systems: PC Configuration, Application note 1465-11	5989-1415EN
This article is the third of a series of four application notes with System Developers in mind. It explains with great depth how you can simplify test integration by taking advantage of open connectivity standards. Meet your throughput requirements yet stay within budget. Where to download: **www.agilent.com**	
System Developer Guide: Using USB in the Test and Measurement Environment, Application note 1465-12	5989-1417EN
This article is the fourth of a series of four application notes with System Developers in mind. It explains with great depth how you can simplify test integration by taking advantage of open connectivity standards. Meet your throughput requirements yet stay within budget. Where to download: **www.agilent.com**	

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www.axiestandard.org
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www.lxistandard.org
LAN eXtensions for Instruments puts the power of Ethernet and the Web inside your test systems. Agilent is a founding member of the LXI consortium.

www.pxisa.org
PCI eXtensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.

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Sweden	0200-88 22 55
United Kingdom	44 (0) 118 927 6201

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